

State of California  
The Resources Agency  
DEPARTMENT OF WATER RESOURCES  
Northern District

RECREATION USE SURVEY OF  
BIG GRIZZLY CREEK, PLUMAS COUNTY  
1997

Technical Information Report No. 99-1

Prepared under the direction of

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This report was prepared to summarize information collected under Work Order 1500-4704 to document recreation and fishery enhancement provided by a revised operation of Lake Davis. This report has received only limited review; it is intended for internal use and should be considered preliminary and subject to revision.

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## SUMMARY

A survey of streamside recreation along Big Grizzly Creek, Plumas County, was conducted in 1997. The purpose of the survey was to estimate the amounts and types of recreation use and angler success occurring along the creek with augmented flow from Lake Davis through Grizzly Valley Dam. The stratified random sample survey combined roving use counts with interviews of recreationists in order to gather information on recreation activities, visitor origin, and angler success.

There were an estimated 5,000 hours of recreation use on Big Grizzly Creek between April 26 and October 14, 1997. The most frequently observed activity in 1997 was fishing, followed by walking for pleasure. Camping, sightseeing and relaxing were also common activities. About 46 percent of all visitors came from Nevada and 52 percent of all anglers lived in the northeast counties of California, mostly Plumas County. A large proportion of anglers and visitors lived in the City of Portola. Anglers caught an estimated 200 rainbow trout and a few brown trout in 1,300 hours of fishing.

## INTRODUCTION

Big Grizzly Creek below Grizzly Valley Dam offered an opportunity to implement the Department of Water Resources' water management policy, adopted in 1975, which states, "Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses." When Grizzly Valley Dam began operation in 1966, streamflows in Big Grizzly Creek below the dam were increased and stabilized. Minimum flows were increased from about 0.5 cubic feet per second to 8 cfs. Fishing and related streamside recreation were enhanced. An instream flow needs assessment later indicated that increasing flows to 20 cfs would further increase trout habitat over the post-project levels to near optimum levels without significant detriment to lake recreation (Haines 1982).

On a trial basis, Grizzly Valley Dam began a revised operation in June 1982. The Department of Fish and Game and DWR agreed to further revise operating criteria and releases in a 1994 agreement which was first implemented in 1998. Monitoring downstream recreation use, fish populations, and trout catch will document changes to these resources caused by the modified flow release schedules. The agreement further obligated DWR to monitor impacts to reservoir water levels, if any, of this revised operation over the next several years.

This report describes the recreation use survey, creel census, and results for the 1997 trout season, April 26 to November 15. A separate report, prepared by the Department of Fish and Game, Contract Services Section, describes a fish population survey conducted in August 1997 (Brown 1998).

### Description of Study Area

Big Grizzly Creek is a major tributary of the Middle Fork Feather River (a designated National Wild and Scenic River) within the Plumas National Forest. The

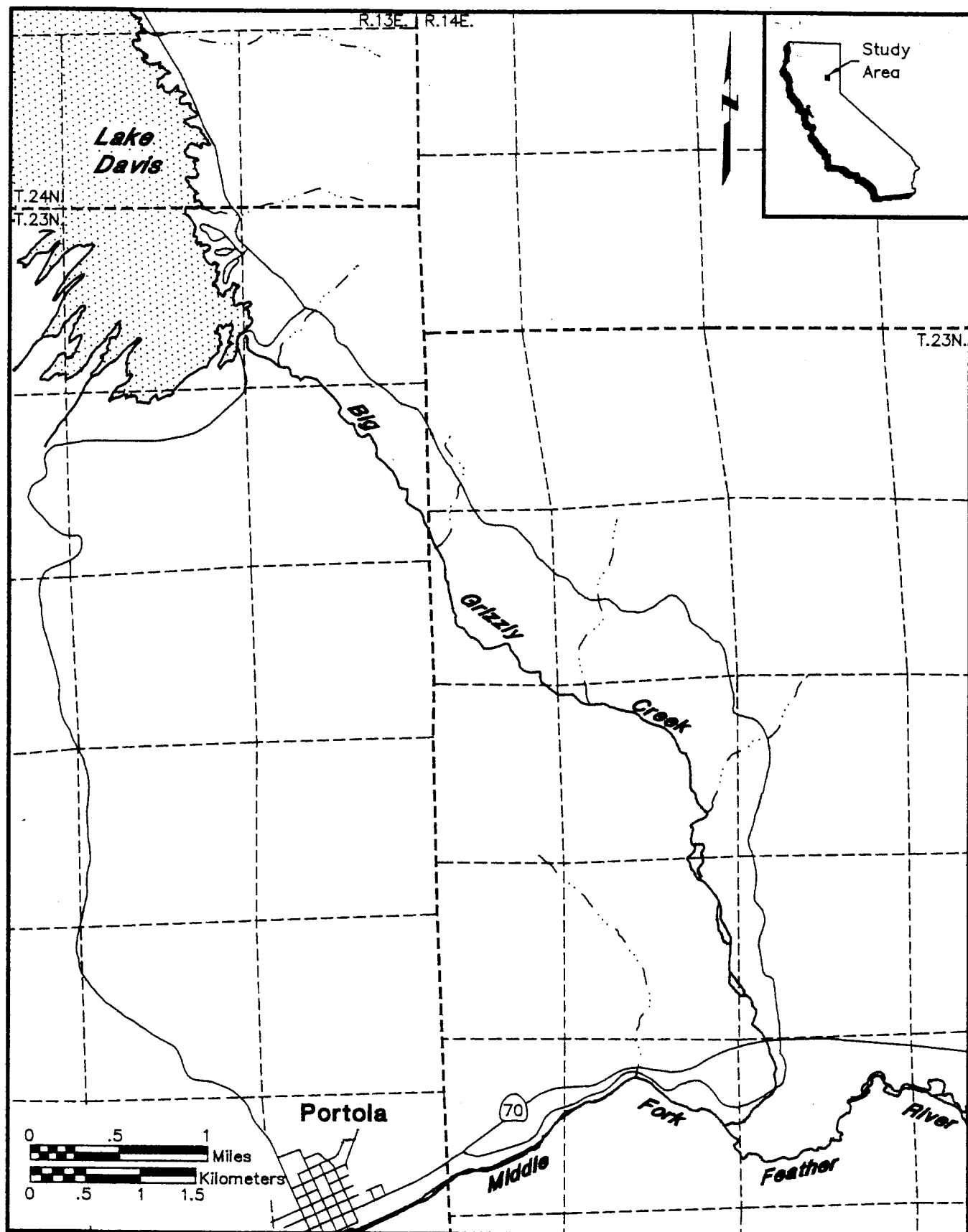
lowest 6.25 miles of the creek is below Grizzly Valley Dam and Lake Davis. From an elevation of 5,670 feet at the dam, the creek drops through steep-walled canyons, flows through the eastern edge of Smith Peak State Game Refuge, crosses under Highway 70 about 2 miles east of the City of Portola, and joins the Middle Fork Feather River on the western side of Sierra Valley at an elevation of 4,870 feet (Figure 1).

Grizzly Road, which also crosses Highway 70, roughly parallels the creek, providing easy access to the mouth of the creek and to Lake Davis. About 3.8 miles upstream from the mouth is a dirt road, called Burnham Ranch Road, which provides public access to some of the more rugged areas of the creek. This road may be improved in the next few years; private lots are being developed adjacent to the public access area described below.

In 1986, DWR used Land and Water Conservation Funds to purchase a strip of land along Big Grizzly Creek to provide public fishing access. This created a public access area below the dam nearly three miles long, although portions of the surrounding area are privately owned and typically posted against trespass. Overall, about 4.25 miles of the 6.25-mile reach of Big Grizzly Creek below Grizzly Valley Dam is accessible and can be used by anglers and other recreationists. The remaining two miles of the creek are generally inaccessible and/or clearly posted against trespass.

Public access is prohibited at Walton's Grizzly Lodge, a camp for children at the "Grizzly Ice Pond". The camp uses the pond for fishing and swimming and the surrounding area for other camp activities. This use was not measured and is not included in our estimates.

Among other things, Big Grizzly Creek provides visitors with opportunities for trout fishing (predominantly rainbow trout), walking and hiking, flora and fauna study, relief from summer heat in the form of swimming and wading, and enjoyment of fall colors.



**Figure 1. Big Grizzly Creek, Pumas County, 1997.**

The general area has a rich history of gold mining, farming and ranching, lumber production, and railroading. In recent decades, recreation use in Plumas County has increased greatly, with water-related uses a major attraction. Employment today is divided among services, government, timber harvesting, ranching, and farming.

Grizzly Valley Dam was built as part of the State Water Project in 1966. Originally planned to supplement irrigation in Sierra Valley, it was completed mainly to benefit reservoir recreation and the fishery downstream in Big Grizzly Creek, and to provide domestic water to the City of Portola. Releases for recreation, fish, and wildlife are normally based on the water surface elevation on May 1. In addition to the releases for downstream fisheries and water rights, the reservoir is usually operated to prevent spill. This requires large releases of up to 250 cfs in the early spring of some years (DWR 1974). The reservoir did not spill between 1986 and 1995 because of prolonged drought conditions, but high releases have occurred each year since then.

In October 1997 the Department of Fish and Game chemically treated Lake Davis to eradicate non-native northern pike. This action and the resultant closure of the lake had both indirect and direct impacts on recreation and fishing use on Big Grizzly Creek and are discussed later in this report.

## METHODS

### Recreation Use Counts

Use counts were made on randomly selected dates within nine survey strata using the optimum allocation method described by Abramson and Tolladay (1959). Twenty-nine days of the 172-day period from April 26 through October 14, 1997<sup>1</sup>, were surveyed: both days of the opening weekend of trout season, 5 of 9 holiday weekend days, 11 of 119 weekdays, and 11 of 44 weekend days. Five one-hour counts of recreation use were made in the study area each day at regular periods, scheduled according to the number of daylight hours (Appendices I and II).

The surveys were made from vehicle or on foot, as necessary, to check access and recreation sites. Recreationists were counted and recorded by recreation activity. The five daily counts were totaled and multiplied by factors that accounted for recreation use in the daylight periods not counted. Similarly, the resulting daily figures were expanded to estimate total recreation hours for all days in each stratum. Adding the stratum totals provided an estimate of recreation hours for the study period.

### Creel Census

Anglers along Big Grizzly Creek were contacted on 15 of the 29 survey days to determine fishing success (on 14 dates, no anglers were found to interview). The county of residence and length of time spent fishing so far that day were recorded for each angler contacted. Fish censused were counted, measured (fork length to nearest 0.5 cm), and identified to species.

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<sup>1</sup> The California stream fishing season runs through November 15, but the DFG's chemical treatment of Lake Davis effectively ended the fishing/recreation season on Big Grizzly Creek.



To determine total catch, the catch per hour was multiplied by estimated hours of fishing for each stratum and the totals for each stratum were summed. Total weight of trout caught was calculated from estimated total fish caught and application of the length-weight relationship formula for Big Grizzly Creek trout (Brown 1995).

## RESULTS

### Recreation Use

Total recreation use on Big Grizzly Creek was estimated at 5,000 recreation hours ( $\pm 1,300$  hours) for the period April 26 to November 15, 1997. Counts of people along Big Grizzly Creek indicated that, overall, fishing was the major activity, followed by walking, miscellaneous uses, camping, and sightseeing (Table 1).

Table 1. Recreation Hours by Activity  
Big Grizzly Creek, 1997

|                      | Recreation<br>Hours | Percent |
|----------------------|---------------------|---------|
| Fishing              | 1,300               | 26      |
| Walking              | 1,000               | 20      |
| Camping              | 700                 | 14      |
| Sightseeing          | 500                 | 10      |
| Relaxing             | 500                 | 10      |
| Miscellaneous/other* | 1,000               | 20      |
| Total                | 5,000               | 100     |

\* Includes picnicking, horseback riding, bicycling, swimming, and off-highway vehicle use.

Twenty-one interviews were conducted this year, representing 59 people. The interviews revealed what people said they did during their visit. About 66 percent of the visitors to Big Grizzly Creek said they fished, followed by relaxing (56 percent), sightseeing (25 percent), swimming/wading (22 percent), walking for pleasure (8 percent), beach use (7 percent), and miscellaneous other activities

(9 percent). These percentages add up to more than 100 percent because many people took part in more than one activity during their visit.

About 66 percent of the interviewed visitors were day users (i.e., returned home at night), and 24 percent stayed overnight somewhere in the area (usually at one of the cabins along the creek). One group of 6 Portola residents was observed camping along the creek on DWR land (not strictly legal), and on Memorial Day weekend a large group of 30 or more people camped in a privately owned meadow near the mouth of the creek. Otherwise, camping appears to be an infrequent activity.

Visitor origin was predominantly from Nevada, generally the Reno/Sparks area (46 percent). Visitors from California's northeast counties totaled 37 percent of all users. Bay Area visitors made up 10 percent while 7 percent came from Southern California.

#### Creel Census Data and Angler Success

During the 1997 trout season, 67 anglers were contacted. They had fished 90 hours, with an observed catch of 13 rainbow trout (Oncorhynchus mykiss) and 2 brown trout (Salmo trutta). In addition, 26 trout were reported to have been caught and released.

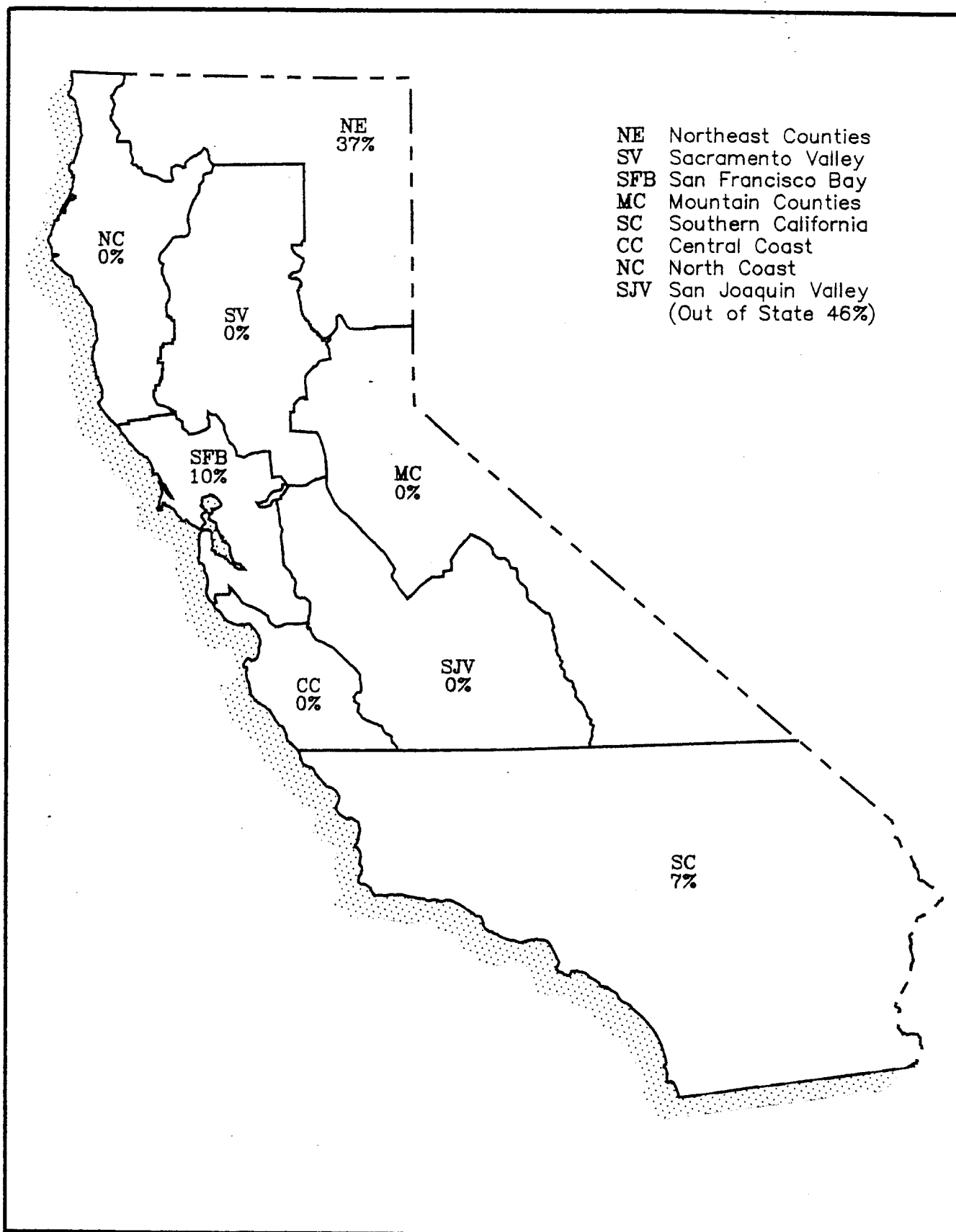
Total angling use was estimated at 1,300 hours ( $\pm 600$  hours) or 1,100 angler days, with an estimated take of 200 rainbow trout and perhaps a dozen brown trout. Based on trout reported caught and released, an additional 500 trout were estimated to have been caught and released.

The mean length of rainbow trout measured during 1997 was 28.6 cm (11.2 in) with a range of 22.5 to 35.0 cm (8.6 to 13.5 in) (Appendix III). Based on the length-weight relationship determined by Brown (1995), an estimated 150 pounds of

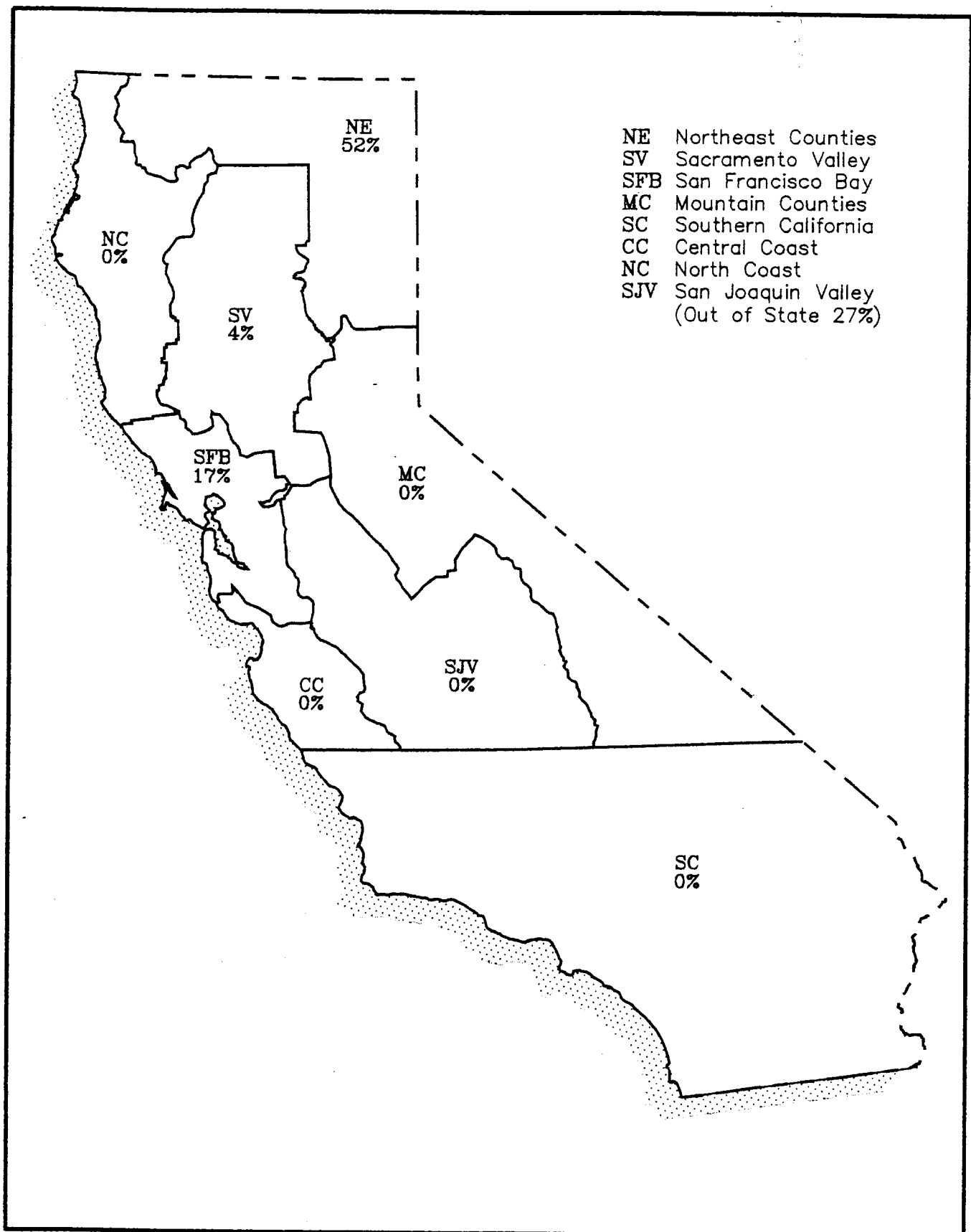
rainbow trout were caught. The two brown trout creels were the smallest fish observed, measuring 21.5 and 19.5 cm fork length.

Big Grizzly Creek angler origin (Figure 3) was predominantly from the northeast counties (52 percent). Anglers from Nevada, mostly Reno and Sparks, totaled 27 percent. Seventeen percent of anglers came from the Bay Area counties, and 4 percent came from the Sacramento Valley counties.

About 72 percent of the anglers fished with bait, about 45 percent with lures and about 7 percent with flies. These percentages add up to more than 100 percent because 24 percent of the anglers used more than one type of terminal gear during their effort.



**Figure 2. Big Grizzly Creek, Visitor Origin by County Groups, 1997.**



**Figure 3. Big Grizzly Creek, Angler Visitor Origin by County Groups, 1997.**

## DISCUSSION

### Counts and Creel Census

Most people using the creek were readily observed during the use counts. Vehicle access points were checked on each count, and people were found for most vehicles. Vehicles of U.S. Forest Service, DWR workers, game wardens and other non-recreationists are sometimes parked along the road, normally making vehicle counts a poor index of recreation use. About 7 percent of the estimated fishing use was represented in the creel census.

### Comparison With Use in 1986, 1991 and 1994

Comparison of the 1997 data with previous surveys conducted on Big Grizzly Creek shows recreation use that is similar to that seen in 1986 and 1991 with a significant decline from the use in 1994. The significantly lower use is likely attributable to the DFG Lake Davis Pike Eradication Project. Table 2 summarizes differences observed over the years.

During the 1997 trout season, anglers fished an estimated 1,300 hours, with an estimated catch of 200 rainbow trout and a dozen brown trout. Thus, fishing use in 1997 was considerably less than in 1986 and 1994, but somewhat greater than 1991 (a drought year). The catch in 1997 was considerably less than in other years. Angler success (trout/angler-hour) has declined each year; perhaps a reflection of proportionately more catch-and-release occurring. However, the mean length of trout in 1997 (11.2 in) was significantly greater than either 1986 (9.0), 1991 (8.4 in) or 1994 (10.4 in). Also, standing stock estimates in 1997 were higher than ever observed before (Brown, 1998). However, aside from the low use, no other explanation for the low catch is readily apparent.

Northern pike were discovered in Lake Davis in 1994. Upon this discovery the Department of Fish and Game set about planning for the eradication of this non-native species. As part of their plan to chemically treat the lake there were several actions that affected the lower portions of Big Grizzly Creek below the dam.

The first of these was the draw-down of the lake during spring and early fall which caused unusually high flows in the creek. These flows made fishing more difficult and could have affected fishing activity by causing anglers to seek out streams with a more typical flow for that time of year. During the summer, flow was 10 cfs (instead of the normal 20 cfs) for reasons related to the legal challenges to DFG's project.

Also, Lake Davis and surrounding recreation facilities were closed to all public use on October 14. Big Grizzly Creek is not located within this area, but this closure likely had a large impact on recreation and fishing on the creek, even though it remained legally open to fishing through November 15. Finally, the action that had the most direct impact on the creek was the unexpected fish kill in the creek when un-neutralized rotenone escaped through the valve at the dam during the treatment. The most popular fishing area on the creek, near the confluence with the Feather River, was not affected by the chemical escape, but public perception of chemicals in the stream probably kept anglers from fishing the creek after treatment began.



Table 2

Estimated Recreation Hours by Activity,  
Big Grizzly Creek 1986, 1991, 1994, 1997<sup>2</sup>

|                       | Year        |             |             |             |
|-----------------------|-------------|-------------|-------------|-------------|
| <u>Activity</u>       | <u>1986</u> | <u>1991</u> | <u>1994</u> | <u>1997</u> |
| Fishing               | 2,900       | 800         | 2,200       | 1,300       |
| Swim/Wade             | 800         | 1,000       | 600         | *           |
| Camping               | *           | *           | *           | 700         |
| Relaxing              | 200         | 200         | 1,000       | 500         |
| Sightseeing           | 30          | 200         | 2,300       | 500         |
| Walking               | 20          | 400         | 1,000       | 1,000       |
| Miscellaneous/Other** | 450         | 1,100       | 1,900       | 1,000       |
| Totals                | 4,400       | 3,700       | 9,000       | 5,000       |

\* Negligible, included in miscellaneous for that year.

\*\* Includes: picnicking, horseback riding, shooting, bicycling, and OHV-use.

Comparison of General Recreation, Fishing Use, and  
Angling Quality on Big Grizzly Creek

|   | Year        |             |             |             |
|---|-------------|-------------|-------------|-------------|
| <u>Activity</u>                             | <u>1986</u> | <u>1991</u> | <u>1994</u> | <u>1997</u> |
| Recreation Use (Hours)                      | 4,400       | 3,700       | 9,000       | 5,000       |
| Fishing Use (Hours)                         | 2,900       | 800         | 2,200       | 1,300       |
| Rainbow Trout Caught<br>(Estimated)         | 2,300       | 500         | 900         | 200         |
| Brown Trout Caught<br>(Estimated)           | 50          | 0 creeled   | 30          | 10+         |
| Angling Quality<br>(trout caught per hour)* | 0.81        | 0.62        | 0.42        | 0.16        |

\* Does not include fish caught and released.

<sup>2</sup> Data from earlier years were as reported by Tittle (1987), J. Brown (1992), and Scott (1995).

## ACKNOWLEDGEMENTS

The use counts, creel censuses, and interviews were conducted by the author, with thanks to Doug Rischbieter for his help on opening weekend and several other survey days. Thanks to Michael Serna for preparing the figures and Lori Miles who typed the text and tables.

## REFERENCES

- Abramson, Norman, and Joyce Tolladay. 1959. "The Use of Probability Sampling for Estimating Annual Number of Angler Days". California Department of Fish and Game. 45(4):303-311.
- Brown, Charles J. 1995. "Standing Stocks of Fishes in Sections of Big Grizzly Creek, Plumas County, 1994." Department of Fish and Game, Bay-Delta and Special Water Projects Division.
- \_\_\_\_\_. 1998. "Standing Stocks of Fishes in Sections of Big Grizzly Creek, Plumas County, 1997." Department of Fish and Game, Bay-Delta and Special Water Projects Division.
- Brown, Julie. 1992. Recreation Use Survey of Big Grizzly Creek, Plumas County, 1991. Northern District Technical Information Report No. 92-2. Department of Water Resources. 18 pp.
- Department of Water Resources. 1974. "California State Water Project, Volume III. Storage Facilities." Bulletin No. 200. 485 pp. (pp. 47-60, Grizzly Valley Dam and Lake Davis).
- Haines, Sharon L. 1982. "Upper Feather River Instream Flow Study". Department of Water Resources, Northern District. 35 pp.
- Scott, Joseph. 1995. Recreation Use Survey of Big Grizzly Creek, Plumas County, 1994. Northern District Technical Information Report No. 95-1. Prepared under the direction of Douglas C. Rischbieter, Environmental Specialist III. Department of Water Resources. 27 pp.
- Tittel, Jerry D. 1987. "Recreation Use Survey of Big Grizzly Creek, Plumas County, 1986". Department of Water Resources, Northern District Technical Information Report No. 87-2. 17 pp.

# APPENDIX I

## SCHEDULE FOR BIG GRIZZLY CREEK RECREATION SURVEY APRIL 26, 1997 TO NOVEMBER 15, 1997

| Date  | Holiday (HD)<br>Weekend (WE)<br>Weekday (WD) | Survey Stratum               |
|---|--|------------------------------|
| April 26<br>April 27<br>April 28                              | WE<br>WE<br>WD                               | I<br>I<br>IV                 |
| May 11<br>May 19<br>May 25<br>May 26<br>May 31                | WE<br>WD<br>HD<br>HD<br>WE                   | III<br>IV<br>II<br>II<br>III |
| June 1<br>June 8<br>June 12<br>June 17                        | WE<br>WE<br>WD<br>WD                         | III<br>III<br>IV<br>IV       |
| July 2<br>July 6<br>July 7<br>July 13<br>July 19              | WD<br>HD<br>WD<br>WE<br>WE                   | VI<br>IX<br>VI<br>V<br>V     |
| August 10<br>August 12<br>August 14<br>August 17<br>August 30 | WE<br>WD<br>WD<br>WE<br>HD                   | V<br>VI<br>VI<br>V<br>IX     |
| September 1<br>September 6<br>September 13<br>September 16    | HD<br>WE<br>WE<br>WD                         | IX<br>VII<br>VII<br>VIII     |
| October 2<br>October 5  | WD<br>WE                                     | VIII<br>VII                  |
| November 4  | WD   | VIII                         |

## APPENDIX II

### 1997 USE COUNT SCHEDULE FOR BIG GRIZZLY CREEK

| <u>Date</u>         | <u>Daylight<br/>Hours</u> | <u>Use Count</u> |             | <u>Creel Census<br/>Time (approx.)</u> |
|---------------------|---------------------------|------------------|-------------|--|
|                     |                           | <u>Count</u>     | <u>Time</u> |  |
| April-August<br>PDT | 16-1/2                    | 1st              | 0700-0800   | 0800-1300                              |
|                     |                           | 2nd              | 1000-1100   | 1400-1900                              |
|                     |                           | 3rd              | 1300-1400   |  |
|                     |                           | 4th              | 1600-1700   |  |
|                     |                           | 5th              | 1900-2000   |  |
| September<br>PDT    | 14                        | 1st              | 0730-0830   | 0830-1230                              |
|                     |                           | 2nd              | 1000-1100   | 1330-1730                              |
|                     |                           | 3rd              | 1230-1330   |  |
|                     |                           | 4th              | 1500-1600   |  |
|                     |                           | 5th              | 1730-1830   |  |
| October<br>PDT      | 13                        | 1st              | 0800-0900   | 0900-1230                              |
|                     |                           | 2nd              | 1000-1100   | 1300-1700                              |
|                     |                           | 3rd              | 1230-1330   |  |
|                     |                           | 4th              | 1500-1600   |  |
|                     |                           | 5th              | 1700-1800   |  |
| November<br>PST     | 12                        | 1st              | 0730-0830   | 0830-1130                              |
|                     |                           | 2nd              | 0930-1030   | 1230-1530                              |
|                     |                           | 3rd              | 1130-1230   |  |
|                     |                           | 4th              | 1330-1430   |  |
|                     |                           | 5th              | 1530-1630   |  |

APPENDIX III  
Rainbow Trout Creeled - Big Grizzly Creek 1997

